METHODS & TECHNIQUES

A Compact Aquarium Unit for Macrophotography

BY

J. SHERMAN BLEAKNEY

Department of Biology
Acadia University, Wolfville, Nova Scotia

(1 Plate; 2 Text figures)

THE USUAL laboratory arrangement for photographing many species of marine invertebrates consists of a rather large glass aquarium supported several inches above a black background. This somewhat cumbersome setup and modifications of it are well illustrated in BLAKER's (1965) "Photography for Scientific Publication", but none of these answered my problem of a portable, unbreakable aquarium that could be conveniently packed and transported with camera and accessory lenses.

The final unit design is depicted in Figure 1 and consists basically of a small rectangular acrylic plastic aquarium tank with a lengthwise pocket beneath, and a narrow vertical pocket at one end. The "ventral" pocket raises the tank so that a suitable background can be inserted into this space beneath the tank. I carry a variety of coloured and textured cloths, as well as black velvet, cemented to file cards and cut to fit this lower chamber. With this series of backgrounds a specimen can be photographed first with standard black velvet and then other cards can quickly be substituted. The vertical pocket holds a reflector of aluminum foil taped to a file card. It serves to soften the deep shadows created by the flash unit which is aimed horizontally through the depth of water from the opposite side of the tank (Figure 2). Depending upon the specimen being photographed or the effect desired, the

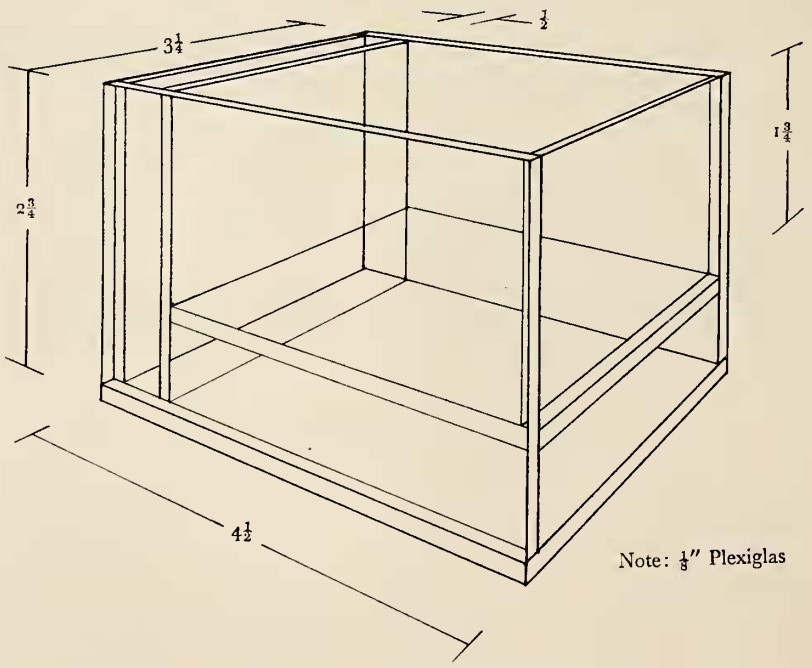

Figure 1

Aquarium unit with a ventral pocket for insertion of background colors, and a vertical pocket to house flash reflectors

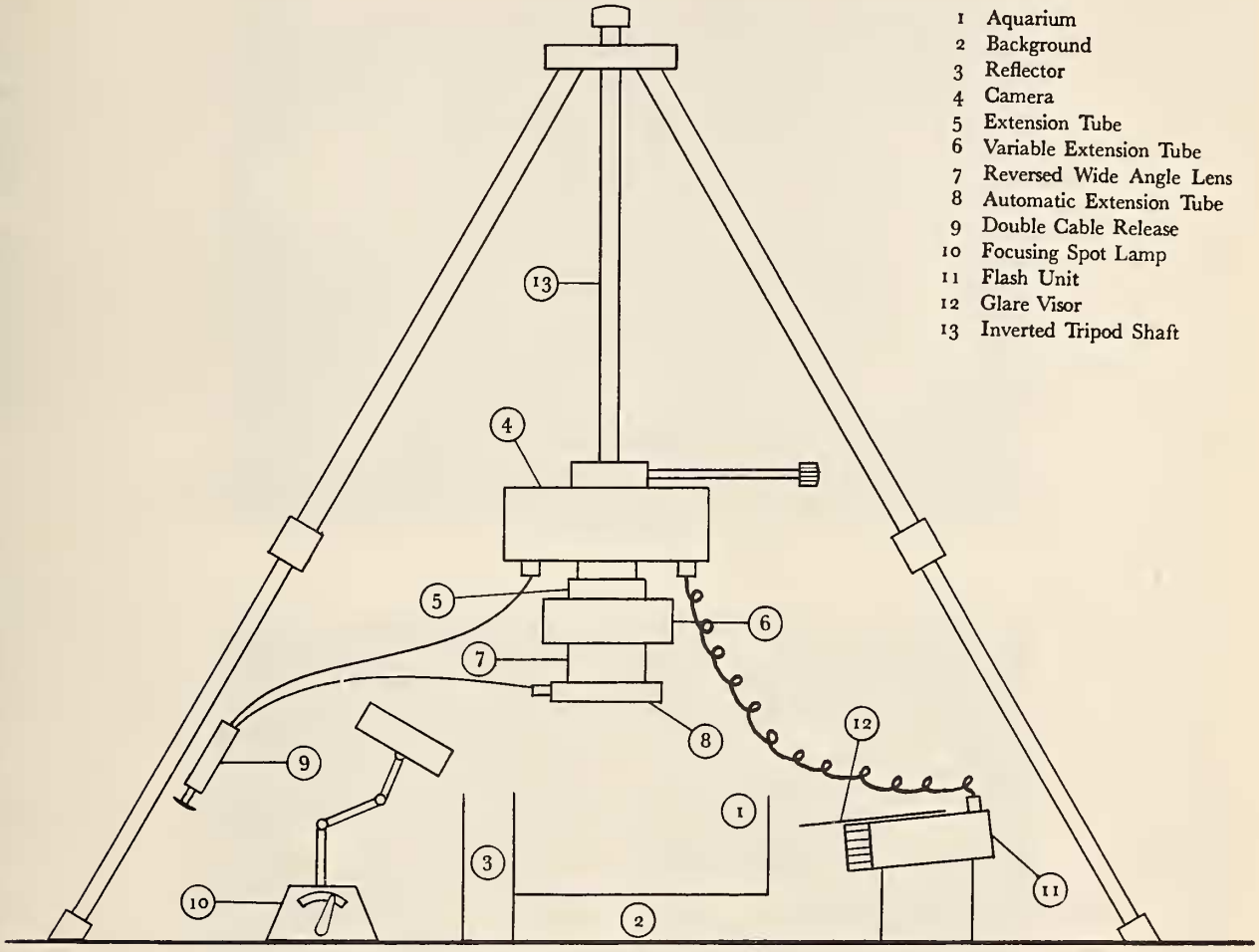

Figure 2

Diagram of macrophotography arrangement using aquarium-background-reflector unit

reflector unit can be quickly changed from aluminum to white paper or omitted entirely.

This basic combination of (a) camera and flash unit, (b) focusing lamp, and (c) aquarium-background-reflector unit can be conveniently set up in a few moments; an important advantage when working with captive sensitive nudibranchs. On a sunny day in the field the focusing lamp and flash unit are not necessary. The aquarium material is durable clear acrylic, but will scratch; however, as photographs are taken through the water surface this disadvantage is of no consequence. If one plans to photograph animals over a wide range of sizes, a nesting set of 2 or 3 units can be made, in which one entire unit fits neatly into the tank of the next unit.

This aquarium unit was devised for opisthobranch photography, but is suitable for any sessile, slow moving, or preserved organism. My own system is to place freshly caught nudibranchs in a refrigerator and add the aquarium unit and a jar of filtered sea water from the same bay. Specimens and aquarium and sea water are brought to

the camera and transferred to the chilled tank. Focusing is done by moving the tripod legs using both hands, one of which holds the double cable release and a switch (or blackout card) for the focusing lamp. After each specimen is photographed the tank is washed out with sea water and wiped with a paper towel to remove any mucous trails. Many species produce substances which elicit either an active avoidance response or a contraction and inactivity response from other species if added to the same water immediately afterwards. I have found it nearly impossible to obtain photographs of normally active nudibranchs unless the aquarium is emptied and cleaned after each species has been photographed. With such a small aquarium unit this can be accomplished very quickly. If lens, tubes or film need changing, then the entire aquarium unit with specimens can be placed in the refrigerator during that period to keep the water chilled.

The most versatile and convenient combination of lenses and accessories that I have found for our generally small North Atlantic nudibranchs is a 58 mm camera lens, a reverse 35 mm wide angle lens, a variable extension tube (0 - 30 mm) and a standard set of extension tubes. The variable extension tube is excellent for zooming down on parts of one specimen and conversely for enlarging the field of view to include 2 specimens in one frame, or a specimen plus its spawn.

Colour reproductions of two species photographed by the above technique (Figures *3* and *4*) are presented not for their beauty, but because of contrast with hand executed illustrations in standard references. The *Acteon tornatilis* (Linnaeus, 1758) diagrams in Hyman (1967), Graham & Fretter (1964), and Pruvot-Fol (1954), bear poor structural and pattern resemblance to this average specimen from South Wales. The first colour illustration of *Alderia modesta* (Lovén, 1844) from our east coast is the peculiar figure 227, plate XVI in Gould & Binney (1870). The drawing of a Californian specimen in Hand & Steinberg (1955) is accurate, but again based on average sized specimens of 5 to 8 mm and does not have the unexpected proportions found in large 14 mm specimens common in Nova Scotia. Note that cerata of the right side are in a contraction phase and the left ones are expanded. The rhythmical contraction of the rows of cerata substitutes for an atrophied heart.

The author is indebted to Dr. Henning Lemche and Mr. James Lance for their initial encouragement and helpful suggestions towards more successful photography of living nudibranchs. This technique was developed in connection with a study of Nova Scotia nudibranchs supported by a National Research Council of Canada Grant.

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